

# CARLISLE AREA SCHOOL DISTRICT

Carlisle, PA 17013

**Science**

**Grade 6**

Date of Board Approval: **May 21, 2009**

# CARLISLE AREA SCHOOL DISTRICT

## PLANNED INSTRUCTION COVER PAGE

Title of Course: Science Subject Area: Science Grade Level: 6

Course Length: (Semester/Year): Year Duration: \_\_\_\_\_ Frequency: Daily

Prerequisites: None Credit: None Level: Not applicable

### **Course Description/Objectives:**

The district shall provide for attainment of the academic standards per Chapter 4, Section 4.12. Each student shall demonstrate proficiency in the following areas: unifying themes; inquiry and design; biological sciences; physical science, chemistry and physics; earth sciences; technology education; science, technology and human endeavors; watersheds and wetlands, renewable and non-renewable resources; environmental health; agriculture and society; integrated pest management; ecosystems and their interactions; threatened, endangered and extinct species; humans and the environment; and, environmental laws and regulations.

Major Texts: Science Explorer, Prentice Hall, 2009 (The Nature of Science and Technology, Inside Earth, Weather and Climate and Astronomy)

Major Resources: Full Option Science Program (FOSS) – Variables  
Full Option Science Program (FOSS) – Levers and Pulleys

Curriculum Writing Committee: Michael Beachy Christine Rogers Jan Jackson  
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Unit: What is Science?	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.2.7A Explain and apply scientific and technological knowledge.	<ul style="list-style-type: none"> <li>Distinguish between scientific theory and an opinion (PSSA).</li> <li>Explain how a theory is supported with evidence or how new data/information may change existing theories and practice (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.2.7A Explain and apply scientific and technological knowledge.	<ul style="list-style-type: none"> <li>Differentiate between a fact and a theory using multiple examples.</li> <li>Show how facts are used to develop a theory.</li> <li>Explain how a theory becomes a law.</li> </ul>	
3.8.7C Identify the pros and cons of applying technological and scientific solutions to address problems and the effect upon society.	<ul style="list-style-type: none"> <li>Evaluate positive and negative impacts of scientific research and/or technology on society (PSSA).</li> </ul>	
No Standard	<ul style="list-style-type: none"> <li>Illustrate the silhouette of a scientist to demonstrate characteristics versus stereotypes.</li> </ul>	
No Standard	<ul style="list-style-type: none"> <li>Identify specific stereotypes we have about scientists such as: lab coats, male, Caucasian, work in a lab and work alone.</li> </ul>	

Unit: What is Science	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
No Standard	<ul style="list-style-type: none"> <li>Identify characteristics of scientists such as: varied genders and races, work outdoors and inside, and work in teams.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
No Standard	<ul style="list-style-type: none"> <li>Classify various disciplines in science such as geology, biology and physics into three branches: Earth, Life and Physical Science.</li> </ul>	

<b>Unit: Metric Measurement</b>	<b>Subject Area: Science</b>	<b>Grade: 6</b>
<b>PA Academic Standards</b>	<b>Performance Indicators</b>	
3.1.7C Identify patterns as repeated processes or reoccurring elements in science and technology.	<ul style="list-style-type: none"> <li>Define prefixes (size/amount): milli, centi, and kilo as used with metric base units (meter, liter and gram).</li> <li>Convert from one metric unit to another using the base ten system.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Apply metric measurements in lab situations (linear, volume, mass and density) (PSSA).</li> <li>Differentiate between mass and weight.</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Describe the relationship between mass and volume (density) (PSSA).</li> <li>Describe the relationship between density and buoyancy (PSSA).</li> </ul>	
3.7.7A Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.	<ul style="list-style-type: none"> <li>Identify the appropriate metric tool for a specific task: graduated cylinder, triple-beam balance, meter stick and metric ruler (PSSA).</li> </ul>	
3.7.7B Use appropriate instruments and apparatus to study materials.	<ul style="list-style-type: none"> <li>Use appropriate tools to make metric measurements (mass, density, volume and length).</li> </ul>	

Unit: Metric Measurement	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
No Standard	<ul style="list-style-type: none"> <li>Write a persuasive essay to persuade someone that the metric system is the superior system.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments

Unit: Variables	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Describe relationships between the independent and dependent variables (PSSA).</li> <li>Make inferences and predictions using data from graphs (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Design a controlled experiment (PSSA).</li> <li>Graph and interpret data using a variety of graphs (concrete, picture and two-coordinate) (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Use a two-coordinate graph to show relationships and make predictions (PSSA).</li> <li>Find the capacity of a container.</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Identify, define and manipulate variables.</li> <li>Use error analysis to identify questionable results (PSSA).</li> </ul>	
3.2.7C Identify and use the elements of scientific inquiry to solve problems. 3.2.7D Know and use the technological design process to solve problems.	<ul style="list-style-type: none"> <li>Use error analysis to identify questionable results (PSSA).</li> <li>Describe a controlled experiment and explain why only one variable is tested at a time (PSSA).</li> </ul>	

Unit: Variables	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.7.7A Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.	<ul style="list-style-type: none"> <li>Identify the appropriate metric tool for a specific task: graduated cylinder and metric ruler (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.7.7B Use appropriate instruments and apparatus to study materials.	<ul style="list-style-type: none"> <li>Use appropriate tools to make metric measurements (capacity and length) (PSSA).</li> </ul>	



Unit: Scientific Method	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Know the steps of the scientific method (state the problem, gather information, form a hypothesis, conduct the experiment, record and analyze information, state the conclusion, repeat the experiment).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Sequence the steps of the scientific method by using simulated experiments.</li> <li>Explain how certain questions can be answered through scientific inquiry (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Raise testable questions and formulate a hypothesis (PSSA).</li> <li>Classify and categorize actions of scientists according to the steps of the scientific method.</li> </ul>	
3.2.7D Know and use the technological design process to solve problems.	<ul style="list-style-type: none"> <li>Evaluate and analyze whether the steps of the scientific method were used appropriately in a given scenario (PSSA).</li> </ul>	

Unit: Space	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.1.7B Describe the use of models as an application of scientific or technological concepts.	<ul style="list-style-type: none"> <li>Label a diagram of the layers of the Earth.</li> <li>Draw, label and/or manipulate models of the different types of faults.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.1.7B Describe the use of models as an application of scientific or technological concepts.	<ul style="list-style-type: none"> <li>Demonstrate the movement of seismic waves.</li> <li>Use models to classify types of volcanoes (PSSA).</li> </ul>	
3.1.7D Explain scale as a way of relating concepts and ideas to one another by some measure.	<ul style="list-style-type: none"> <li>Use scale to illustrate the size of and distance between celestial bodies (sun to planets, planets to planets).</li> </ul>	
3.2.7A Explain and apply scientific and technological knowledge.	<ul style="list-style-type: none"> <li>Explain how technology has increased and changed our understanding of space (PSSA).</li> </ul>	
3.4.7D Describe essential ideas about the composition and structure of the universe and the earth's place in it.	<ul style="list-style-type: none"> <li>Compare and contrast characteristics of celestial bodies of the solar system (PSSA).</li> <li>Differentiate between and describe comets, asteroids, and meteors (PSSA).</li> </ul>	

Unit: Space	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.4.7D Describe essential ideas about the composition and structure of the universe and the earth's place in it.	<ul style="list-style-type: none"> <li>Identify gravity as the force that keeps planets in orbit around the sun and governs the rest of the movement of the solar system and the universe (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments

<b>Unit: Changing Earth</b>	<b>Subject Area: Science</b>	<b>Grade: 6</b>
<b>PA Academic Standards</b>	<b>Performance Indicators</b>	
3.1.7B Describe the use of models as an application of scientific or technological concepts.	<ul style="list-style-type: none"> <li>• Label a diagram of the layers of the Earth.</li> <li>• Draw, label and/or manipulate models of the different types of faults.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.1.7B Describe the use of models as an application of scientific or technological concepts.	<ul style="list-style-type: none"> <li>• Demonstrate the movement of seismic waves.</li> <li>• Use models to classify types of volcanoes (PSSA).</li> </ul>	
3.1.7C Identify patterns as repeated processes or recurring elements in science and technology.	<ul style="list-style-type: none"> <li>• Graph differences in P and S waves (PSSA).</li> <li>• Map and predict the epicenter of an earthquake (PSSA).</li> </ul>	
3.1.7C Identify patterns as repeated processes or recurring elements in science and technology.	<ul style="list-style-type: none"> <li>• Plot the occurrence of earthquakes and volcanic eruptions around the Earth (PSSA).</li> </ul>	
3.1.7D Explain scale as a way of relating concepts and ideas to one another by some measure.	<ul style="list-style-type: none"> <li>• Describe the appropriate use of instruments and scales to measure earthquakes (PSSA).</li> </ul>	

Unit: Changing Earth	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.1.7E Identify change as a variable in describing natural and physical systems.	<ul style="list-style-type: none"> <li>Describe how stresses and resulting movements change the Earth's crust (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.2.7A Explain and apply scientific and technological knowledge.	<ul style="list-style-type: none"> <li>Describe how past geologic theories impact current scientific thinking (PSSA).</li> </ul>	
3.5.7A Describe earth features and processes.	<ul style="list-style-type: none"> <li>Label a diagram of the layers of the Earth.</li> <li>Describe the processes involved in the creation of geologic features (fold, faults, mountains and trenches) (PSSA).</li> </ul>	
3.5.7A Describe earth features and processes.	<ul style="list-style-type: none"> <li>Distinguish between rapid changes in Earth's structure (earthquakes and volcanoes) and slow surface changes (mountain forming and continental drift) (PSSA).</li> </ul>	

Unit: Levers	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.1.7A Explain the parts of a simple system and their relationship to each other.	<ul style="list-style-type: none"> <li>Describe the parts of a lever system and explain how they work together to give us an advantage (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.1.7B Describe the use of models as an application of scientific or technological concepts.	<ul style="list-style-type: none"> <li>Identify and diagram three classes of levers and real-world levers.</li> <li>Given a model of a lever, predict the advantage of the system (PSSA).</li> </ul>	
3.1.7E Identify change as a variable in describing natural and physical systems.	<ul style="list-style-type: none"> <li>Given a model of a lever, predict the advantage of the system (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Graph the results of lever experiments and use the results to state relationships between the variables (effort/load, position of effort/load) (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Analyze data to determine the most advantageous lever system (PSSA).</li> </ul>	

Unit: Levers	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.2.7C Identify and use the elements of scientific inquiry to solve problems.	<ul style="list-style-type: none"> <li>Describe how a lever can be used to solve practical problems (PSSA).</li> <li>Construct different lever systems and measure the effort.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.7.7A Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.	<ul style="list-style-type: none"> <li>Describe the appropriate lever for a given task.</li> </ul>	

Unit: Pulleys	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.1.7A Explain the parts of a simple system and their relationship to each other.	<ul style="list-style-type: none"> <li>Describe the parts of a pulley system and explain how they work together to give us an advantage (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.1.7B Describe the use of models as an application of scientific to technological concepts.	<ul style="list-style-type: none"> <li>Given a model of a pulley, predict the advantage of the system (PSSA).</li> </ul>	
3.1.7E Identify change as a variable in describing natural and physical systems.	<ul style="list-style-type: none"> <li>Given a model of a pulley, predict the advantage of the system (PSSA).</li> <li>Diagram pulley systems to show relationships between variables (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Analyze data to determine the most advantageous pulley system (PSSA).</li> </ul>	
3.2.7C Identify and use the elements of scientific inquiry to solve problems.	<ul style="list-style-type: none"> <li>Describe how a pulley can be used to solve practical problems (PSSA).</li> <li>Construct different pulley systems and measure the effort.</li> </ul>	



Unit: Pulleys	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.7.7A Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.	<ul style="list-style-type: none"> <li>Describe the appropriate pulley for a given task.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments

Unit: Weather	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
3.1.7A Explain the parts of a simple system and their relationships to each other.	<ul style="list-style-type: none"> <li>Identify the atmospheric factors that make up a weather system (PSSA).</li> <li>Diagram the greenhouse effect.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.1.7C Identify patterns as repeated processes or recurring elements in science and technology.	<ul style="list-style-type: none"> <li>Classify and diagram local and global wind patterns (PSSA).</li> <li>Describe the effects of changing air pressure on weather (PSSA).</li> </ul>	
3.2.7B Apply process knowledge to make and interpret observations.	<ul style="list-style-type: none"> <li>Use a thermometer, psychomotor, barometer, anemometer, wind vane and rain gauge to gather and interpret weather data (PSSA).</li> </ul>	
3.4.7B Relate energy sources and transfers to heat and temperature.	<ul style="list-style-type: none"> <li>Demonstrate how the angles of the sun's rays affect the Earth's temperature.</li> <li>Explain how heat is transferred in the atmosphere through conduction, convection and radiation (PSSA).</li> </ul>	
3.5.7C Describe basic elements or meteorology.	<ul style="list-style-type: none"> <li>Identify how cloud types, wind directions and barometric pressure changes are associated with weather (PSSA).</li> </ul>	

<b>Unit: Weather</b>	<b>Subject Area: Science</b>	<b>Grade: 6</b>
<b>PA Academic Standards</b>	<b>Performance Indicators</b>	
3.5.7C Describe basic elements or meteorology.	<ul style="list-style-type: none"> <li>Identify how global patterns of atmospheric movement influence regional weather (PSSA).</li> <li>Describe and illustrate the major layers of the Earth's atmosphere.</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
3.5.7C Describe basic elements or meteorology.	<ul style="list-style-type: none"> <li>Explain how extreme weather events (tornadoes, hurricanes and blizzards) are formed and affect our lives.</li> </ul>	
3.5.7D Explain the behavior and impact of the earth's water systems.	<ul style="list-style-type: none"> <li>Describe precipitation's role in the water cycle (PSSA).</li> </ul>	
3.7.7B Use appropriate instruments and apparatus to study materials.	<ul style="list-style-type: none"> <li>Use a thermometer, psychomotor, barometer, anemometer, wind vane and rain gauge to gather and interpret weather data (PSSA).</li> </ul>	
4.8.7B Explain how people use natural resources.	<ul style="list-style-type: none"> <li>Explain how extreme weather events (tornadoes, hurricanes and blizzards) influence our lives.</li> </ul>	

Unit: Environmental	Subject Area: Science	Grade: 6
PA Academic Standards	Performance Indicators	
4.2.7B Examine the renewability of resources.	<ul style="list-style-type: none"> <li>Identify renewable and nonrenewable energy resources (PSSA).</li> <li>Compare the time spans of renewability for fossil fuels and alternative fuels (PSSA).</li> </ul>	Teacher made tests and quizzes Chapter tests and quizzes Curriculum-based assessments Standardized tests Demonstrations Performance assessments Portfolios Research papers Essays Oral presentations Multi-media presentations Experiments
4.2.7B Examine the renewability of resources.	<ul style="list-style-type: none"> <li>Describe the waste (kind and quantity) derived from renewable and nonrenewable resources and their impact on the environment (PSSA).</li> </ul>	
4.2.7D Describe the role of recycling and waste management.	<ul style="list-style-type: none"> <li>Identify ways to conserve energy in the home and community.</li> </ul>	

## **Adaptations/Modifications for Students with I.E.P.s**

Adaptations or modifications to this planned course will allow exceptional students to earn credits toward graduation or develop skills necessary to make a transition from the school environment to community life and employment. The I.E.P. team has determined that modifications to this planned course will meet the student's I.E.P. needs.

Adaptations/Modifications may include but are not limited to:

### **INSTRUCTION CONTENT**

- Modification of instructional content and/or instructional approaches
- Modification or deletion of some of the essential elements

### **SETTING**

- Preferential seating

### **METHODS**

- Additional clarification of content
- Occasional need for one to one instruction
- Minor adjustments or pacing according to the student's rate of mastery
- Written work is difficult, use verbal/oral approaches
- Modifications of assignments/testing
- Reasonable extensions of time for task/project completion
- Assignment sheet/notebook
- Modified/adjusted mastery rates
- Modified/adjusted grading criteria
- Retesting opportunities

### **MATERIALS**

- Supplemental texts and materials
- Large print materials for visually impaired students
- Outlines and/or study sheets
- Carbonless notebook paper
- Manipulative learning materials
- Alternatives to writing (tape recorder/calculator)